(12) **United States Patent**
Ni

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(54) **INTERCEPTION-PROOF AUTHENTICATION AND ENCRYPTION SYSTEM AND METHOD**

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### Related U.S. Application Data

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(51) **Int. Cl.**
| | |
|---|---|
| *H04L 29/06* | (2006.01) |
| *G06F 21/00* | (2013.01) |
| *G06F 21/36* | (2013.01) |

(52) **U.S. Cl.**
CPC ........... *G06F 21/36* (2013.01); *H04L 63/0435* (2013.01); *H04L 63/061* (2013.01); *H04L 63/083* (2013.01)

(58) **Field of Classification Search**
CPC . G06F 21/36; H04L 63/0435; H04L 63/083; H04L 63/061
See application file for complete search history.

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(57) **ABSTRACT**

An interception-proof authentication and encryption system and method is provided that utilizes passcodes with individual pins that are made up of symbols from a set of symbols, and tokens that contain at least two symbols from the set of symbols used for the passcode. Multiple tokens (a "token set") are presented to a user, with some or all of a user's pre-selected pins (symbols) randomly inserted into some or all of the tokens. The user selects a token from the token set for each pin position in the passcode. The user is authenticated based on the selected tokens. Because each selected token may or may not contain one of the pre-selected pins in the user's passcode, and also contains other randomly generated symbols that are not one of the pre-selected pins in the user's passcode, someone that observes which tokens the user has chosen cannot determine what the user's actual passcode is.

20 Claims, 43 Drawing Sheets

(GATE_4)

1ˢᵗ Dimension

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

2ⁿᵈ Dimension

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